

### **REMARKS**

Claims 9-18 are pending in this application and have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite, under 35 U.S.C. § 102 as anticipated by Sharma, and/or under 35 U.S.C. § 103 as unpatentable over the combinations of the purported Admissions of Prior Art ("AAPA"),<sup>1</sup> Sharma,<sup>2</sup> Colligan,<sup>3</sup> Clarke,<sup>4</sup> and/or Hoeffleur<sup>5</sup>.

In response, Applicants have amended claims 9, 10, 13 and 14; and added new claims 19 and 20. No new matter has been added by these amendments. In view of these amendments and the remarks below, Applicants respectfully request that the rejections be reconsidered and withdrawn.

#### **REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH**

On page 2, the Office Action contends that the term "rapid-solidified" is a relative term that renders the claims indefinite. Applicants respectfully traverse this rejection because one of ordinary skill in the art would recognize the meaning of "rapid-solidified" after considering the specification, for example page 6, lines 12-18. Notwithstanding this traversal, Applicants have amended claim 9 to delete "rapid-solidified" from the claim. Accordingly, withdrawal of this rejection is respectfully requested.

#### **REJECTION UNDER 35 U.S.C. § 102**

Claims 9, 10 and 11 have been rejected under 35 U.S.C. § 102(b) as anticipated by Sharma.

The Office Action states that "[t]he claim recites sintered pieces 'prepared by pressure sintering a mixture of rapid-solidified' aluminum alloy powder. This is a product by process limitation that does not further limit the scope of the claim (MPEP 2113)."<sup>6</sup>

Applicants have amended claim 9 to recite "... pressure sintering an aluminum

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<sup>1</sup> On page 7, the Office Action contends that the Applicants have admitted that it was known in the art to weld a sintered aluminum alloy by welding sintered pieces (prepared by pressure sintering rapid-solidified

<sup>2</sup> Sharma *et al.*, "Mechanical behavior of friction stir welded powder metallurgy aluminum alloys and composite," FRICTION STIR WELDING PROCESSING (2001): 151-157 ("Sharma").

<sup>3</sup> U.S. Pat. No. 5,794,835 to Colligan *et al.* ("Colligan").

<sup>4</sup> U.S. Pat. No. 4,195,215 to Clarke ("Clarke")

<sup>5</sup> U.S. Pat. No. 3,602,682 to Hoeffleur ("Hoeffleur").

<sup>6</sup> Office Action at page 3.

alloy powder, thereby forming sintered pieces ....” In order for a reference to anticipate a claimed invention, it must teach each and every limitation recited in the claim. MPEP § 2131, citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). Here, Sharma does not teach each and every limitation recited in claim 9 because it does not teach the pressure sintering step. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

### **REJECTION UNDER 35 U.S.C. § 103**

Claims 12-18 have been rejected under 35 U.S.C. § 103 as unpatentable over various combinations of AAPA, Sharma, Colligan, Clarke, and/or Hoeffleur. These rejection can be separated into categories of rejections, those where Sharma is cited as the primary reference, and those where the AAPA is relied upon.

#### **I. REJECTION OF CLAIMS 12-18 WHERE SHARMA IS CITED AS THE PRIMARY REFERENCE**

Claim 12 has been rejected as unpatentable over Sharma, as applied to claim 9, in view of Colligan. Claims 13-14 have been rejected as unpatentable over Sharma, as applied to claim 9, in view of Clarke. And claims 15-18 have been rejected as unpatentable over Sharma and Clarke, as applied to claim 13, in view of Hoeffleur.

The Office Action states that “[t]he claim recites sintered pieces ‘prepared by pressure sintering a mixture of rapid-solidified’ aluminum alloy powder. This is a product by process limitation that does not further limit the scope of the claim (MPEP 2113).”<sup>7</sup> Applicants have amended claim 9 to recite “... pressure sintering an aluminum alloy powder, thereby forming sintered pieces ....” As such, these rejections are now moot because the references cited in these rejections do not provide any reason to friction weld sintered pieces of aluminum alloy power. Therefore, claims 12-18 are patentable over the cited references. New claims 19 and 20 are also patentable over the cited references because the cited references do not teach or suggest an aluminum alloy powder that has an average particle size of 20-100  $\mu\text{m}$  (claim 19), or a gas atomizing step (claim 20).

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<sup>7</sup> Office Action at page 3.

## II. REJECTION OF CLAIMS 9-18 WHERE THE AAPA IS RELIED UPON

Claims 9-11 have been rejected as unpatentable over AAPA in view of Sharma. Claim 12 has been rejected as being unpatentable over AAPA and Sharma, as applied to claim 9, in view of Colligan. Claims 13-14 have been rejected as being unpatentable over AAPA and Sharma, as applied to claim 9, in view of Clarke. Claims 15-18 have been rejected as being unpatentable over AAPA, Sharma and Clarke, as applied to claims 13 and 14, in view of Hoeffleur.

The Office Action contends that "Sharma teaches it being undesirable to use fusion welding processes, such as laser and gas metal welding, to weld sintered pieces of aluminum alloy powder because it creates a cast microstructure that adversely affects mechanical properties of the joint (Introduction)."<sup>8</sup> However, Sharma does not teach friction welding *sintered* pieces. It only states that "[f]riction stir welding (FSW) is a relatively new joining process developed initially for aluminum alloys ..., not sintered pieces of aluminum alloys. The Office Action has not provided any reason why one of ordinary skill in the art would expect that Sharma's teaching would be applicable to sinter pieces.

When making a rejection under 35 U.S.C. § 103, the Examiner has the burden of establishing a *prima facie* case of obviousness. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). To establish a *prima facie* case of obviousness, the prior art must be evaluated based on what it, as a whole, teaches to one of ordinary skill in the art. *In re McLaughlin*, 443 F.2d 1392 (CCPA 1971).

As part of a *prima facie* case, an examiner must establish some reason to combine the references. *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1731 (2007); *Takeda Chemical Industries, Ltd. v. Alpharpharm Pty., Ltd.*, 492 F.3d 1350, 1356-1357 (Fed. Cir. 2007). The *KSR Int'l* Court acknowledged the importance identifying a reason that would have prompted a person of ordinary skill in the art to combine the elements in the way the claimed invention does. *KSR Int'l*, 127 S.Ct. at 1731; *Takeda Chemical*, 492 F.3d at 1356-1357. Repeatedly throughout the *KSR Int'l* decision, the Court discussed the importance that the result obtained by a particular combination was predictable to one of ordinary skill in the art. *KSR Int'l*, 127 S.Ct. at 1731 and 1739-1742.

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<sup>8</sup> Office Action at page 7.

In a recent case, the Board reversed an examiner's rejection for failing to provide the requisite reason to combine the references. *Ikeda*, App No. 08/352,079 at 7. The *Ikeda* application was directed to a method of removing hydrocarbons from exhaust gases. *Id.* at 2. In pertinent part, the claims recited an absorption catalyst B located downstream of a catalyst A in the direction of the exhaust gas. The claims were rejected as unpatentable under 35 U.S.C. § 103 in view of Swaroop, Abe and Patil. *Id.* at 3. Swaroop taught positioning the absorption catalyst B upstream catalyst A. *Id.* at 5. To remedy the deficiency in the art, the examiner cited "Patil and Abe as evidence of the 'conventionality of positioning the adsorbent catalyst 1 either upstream or downstream of a [three-way] catalyst 3' and thus conclude[d] that it would have been obvious to one of ordinary skill in this art to select an appropriate location for the adsorbent catalyst 16 in the apparatus of Swaroop ...." *Id.* at 5-6. The Board held that

The Examiner has failed to provide any cogent reason or technical discussion to support the conclusion that one of ordinary skill in this art would have employed the relative positions of the catalysts in Abe and Patil without the use of the other teachings of these references, namely an auxiliary heater and bypass lines with valving. Second, the Examiner has not explained why one of ordinary skill in this art would have used the teachings of Patil, requiring bypass lines and valving, when Swaroop specifically teaches away from the use of valving and bypass lines [*citation omitted*]. Third, the Examiner has not supplied convincing reasoning or technical discussion to support the proposed switch in relative position of the catalysts when Swaroop specifically teaches that the exhaust gas is "modified" by the adsorbent catalyst and this modified form of the exhaust gas is *then* sent to the main or three-way catalyst to undergo conversion to innocuous products [*citation omitted*]. ... Fourth, the Examiner has not explained why one of ordinary skill in this art would have proceeded contrary to the teachings of Patil, namely the teachings that "it is not possible merely to place zeolite 'in-line' in the exhaust system with the [main] catalyst has reached an effective temperature and unconverted hydrocarbons would still be discharged to the atmosphere" [*citation omitted*].

*Ikeda*, App. No. 08/352,079 at 7.

Here, the Office Action has not established why one would have reasonably expected to successfully friction weld sintered pieces when Sharma only teaches welding powder metallurgy monolithic aluminum alloy and composite.<sup>9</sup> Without such a reason, a obviousness rejection cannot be maintained. Accordingly, reconsideration and withdrawal of

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<sup>9</sup> Sharma at Abstract.

Application No. 10/534,731  
Paper Dated: October 24, 2008  
In Reply to USPTO Correspondence of July 24, 2008  
Attorney Docket No. 5486-051342

these rejections is respectfully requested.

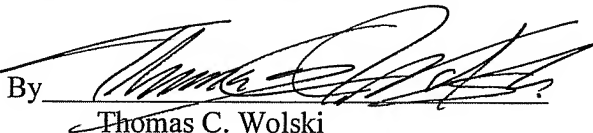
Furthermore, the references cited in these rejections do not teach, suggest or motivate one of ordinary skill in the art to use an aluminum alloy powder that has an average particle size of 20-100  $\mu\text{m}$  (new claim 19), or to gas atomize the aluminum alloy powder (new claim 20).

### CONCLUSION

For this reason, reconsideration and withdrawal of the asserted rejections, and allowance of claims 9-20 are respectfully requested. Should the Examiner have any questions, the Examiner is encouraged to contact the Applicants' undersigned representative at (412) 471-8815.

Respectfully submitted,

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